

I CLAIM:

1. An electrical component testing device comprising:
a housing containing a grid of walls which define a plurality of recesses;
a flexible membrane connected to the housing and extending over a plurality of the recesses forming a plurality of chambers;
a plurality of contact members positioned on the flexible membrane and configured to provide a plurality of electrical connections to a plurality of electrical contacts brought into contact with the contact members; and
a stop to restrict the flexible membrane from traveling beyond a predefined level.
2. The testing device of Claim 1, wherein the flexible membrane comprises a plurality of flexible membranes.
3. The testing device of Claim 1, further comprising at least one fluid passage extending through a portion of the housing and connected to at least one of the chambers to permit passage of a fluid material.
4. The testing device of Claim 3, further comprising a fitting on the at least one fluid passage configured to connect to a pump.
5. The testing device of Claim 3, further comprising at least one lateral passage extending between a plurality of the chambers to permit passage of the fluid material.
6. The testing device of Claim 3, wherein the fluid material comprises a gas.
7. The testing device of Claim 6, wherein the fluid material comprises air.
8. The testing device of Claim 3, wherein the fluid material comprises a liquid.
9. The test device of Claim 1, wherein the stop comprises a plurality of deformable members connected to the plurality of contact members and extending within the chamber to contact a portion of the housing when the plurality of contact members are moved toward the chamber a distance that exceeds the predefined level.
10. The testing device of Claim 9, wherein the plurality of deformable members comprises a plurality of elastomer members having a height of less than a depth of the chamber.

11. The testing device of Claim 1, wherein the plurality of contact members are bumps.
12. The testing device of Claim 1, wherein the plurality of contact members are configured to define a plurality of piercing contacts.
13. A device for testing a plurality of semiconductor devices comprising:
 - a housing;
 - a grid comprising of a plurality of connected frames within the housing;
 - at least one flexible membrane attached to the grid and extending over a plurality of the connected frames to form a plurality of chambers;
 - a plurality of contact members positioned on the at least one flexible membrane and configured to provide an electrical connection to a plurality of electrical contacts on the plurality of semiconductor devices to be tested; and
 - at least one fluid channel connecting at least one of the chambers to a fluid source outside the housing to allow a fluid to flow into at least one of the chambers.
14. The device of Claim 13, wherein the at least one flexible membrane comprises a plurality of flexible membranes.
15. The device of Claim 13, wherein the plurality of semiconductor devices are on an integrated circuit in board on chip configuration.
16. The device of Claim 13, wherein the fluid comprises a gas.
17. The device of Claim 16, wherein the fluid comprises air.
18. The device of Claim 13, wherein the fluid comprises a liquid.
19. The device of Claim 13, wherein the fluid source comprises a pump.
20. The device of Claim 19, wherein the fluid source comprises an electric pump.
21. The device of Claim 13, further comprising at least one passage between a plurality of the chambers allowing the fluid to flow between the chambers.
22. The device of Claim 13, further comprising at least one stop connected to the flexible membrane to restrict the flexible membrane from recessing beyond a predefined level.
23. A method of manufacturing a device for testing a plurality of electrical components comprising:

providing a housing containing a grid of walls defining a plurality of recesses;
securing a flexible membrane, having an inner surface and an outer surface,
over a plurality of the recesses so that the inner surface of the flexible membrane and
the recess define a plurality of chambers;

producing at least one fluid passage through a portion of the housing to
connect at least one of the chambers to the outside of the housing to permit passage of
a fluid material into the chamber; and

securing a plurality of electrical contacts onto the outer surface of the flexible
membrane to provide connection locations for receiving electrical contacts of the
plurality of electrical components to be tested.

24. The method of Claim 23, wherein the plurality of electrical components are on
an integrated circuit in board on chip configuration.

25. The method of Claim 23, wherein the plurality of electrical components
comprise a plurality of chips.

26. The method of Claim 23, further comprising producing at least one lateral
passage between a plurality of the chambers to permit the fluid material to flow between the
chambers.

27. The method of Claim 23, further comprising producing a plurality of fluid
passages which extend through the housing to individually connect the plurality of chambers
to the outside of the housing, and to permit passage of a fluid material into the plurality of
chambers.

28. The method of Claim 23, further comprising providing electrical conductors
which are electrically connected to the plurality of electrical contacts to provide for electrical
connection between the plurality of electrical contacts and testing equipment.

29. A method of testing a plurality of electrical components having a first
plurality of electrical contacts, the method comprising:

supporting a flexible membrane to cover a plurality of recesses within a
housing, wherein the flexible membrane has a plurality of second electrical contacts
positioned thereon and the flexible membrane and the plurality of recesses form a
plurality of chambers;

aligning at least some of the plurality of first electrical contacts with at least some of the plurality of second electrical contacts;

urging the flexible membrane toward the plurality of electrical components to effect an electrical connection between the aligned first and second electrical contacts by introducing a fluid into the plurality of chambers to direct the flexible membrane towards the plurality of electrical components; and

energizing the plurality of electrical components through electrical connections to at least one of the first electrical contacts to perform a test sequence.

30. The method of Claim 29, further comprising restricting relative travel of the electrical component and the flexible membrane where travel of at least one of the electrical component and the flexible member reaches a predefined limit.

31. The method of Claim 30, wherein restricting relative travel comprises attaching a plurality of deformable members on the flexible membrane within the housing to contact the housing when the flexible membrane reaches the predefined limit.

32. The method of Claim 29, wherein urging comprises:

bringing at least a first of the aligned first contacts into electrical connection with at least a first of the aligned second electrical contacts;

filling the plurality of chambers to produce a force on the flexible membrane adjacent to the aligned electrical contacts that have been brought into electrical contact; and

distributing the force across at least a portion of the flexible membrane to thereby urge others of the aligned second electrical contacts toward the aligned first electrical contacts to thereby bring additional first and second aligned electrical contacts into electrical connection with each other.